

NOTES ON MEXICAN BUTTERFLIES, II, PIERIDÆ

By F. MARTIN BROWN

The collections made by Hoogstraal's parties and by Potts contained 33 of the 71 species of Pieridæ reported by Hoffmann. Those lacking are primarily the truly tropical species that enter Chiapas and the southern lowlands and some of the western Nearctic things that are found in Sonora and Baja California. I have added the data from a small collection made by H. D. Thomas in 1936.

Several localities not mentioned in the first paper on the Papilionidæ (*q.v.*)* are noted here:

GEOGRAPHIC DATA

Acahuato, Michoacan, 19° 20' N., 102° 20' W., 3000 ft.

"On the edge of the plateau above Apatzingan. Open semi-desert with scattered trees below the town and open pine forest above it. Transitional between the tropics and temperate area." *Hoogstraal*.

Cumbres, Vera Cruz, 6000 ft., km. 295 on road to Vera Cruz from Mexico City.

"North and west of Orizaba, very definitely up and out of the tropical zone and rain belt, into a dry upland type of country even though still the bottom of the valley. A lot of straggling thorn bush, tremendous organ cactus, a lot of *Opuntia*. Short grass and rock slopes. Temp. at about 75 or less." *Potts*.

El Mante, San Luis Potosi.

"A strange conglomeration in this region of swampy country with tall palms and very tall thorn bush jungle next to bananas, corn fields and maguey. Cactus growing in mud! Temp. probably 95° F." *Potts*.

Hda. Potrero Viejo, nr. Paraje Nuevo, Vera Cruz.

"Cultivated country for centuries, yet plenty of original vegetation nearby. I collected only in a small meadow near the

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hacienda itself." *Potts*. Between Fortin and Orizaba on the Mexico City-Vera Cruz highway.

Hda. Santa Engracia, Tamaulipas.

I have no data on this station. *F.M.B.*

Monte Alban, Oaxaca, $16^{\circ} 50' N.$, $96^{\circ} 20' W.$, 6000 ft.

"Hills back of Oaxaca, the only moist country nearby!"
Potts.

Ojo de Agua, Sabinas Hidalgo, Nuevo Leon, $26^{\circ} 40' N.$, $100^{\circ} 15' W.$, 1000-1600 ft.

"Collections were made up to 1600 ft., low shrubs and cactus."
Hoogstraal.

Orizaba, Vera Cruz, $18^{\circ} 45' N.$, $96^{\circ} 50' W.$, 2200 ft.

"About a kilometer SE. of the town. Just the top end of the tropics or at least the jungle tropics, along the valley slope. Impenetrable underbrush, lush, rains some 9 or 10 months of the year here." *Potts*.

Sta. Lucrecia.

A Thomas station which must be on the west coast, probably in Michoacan, from the material so labeled. *F.M.B.*

Rio Balsas, Guerrero, $18^{\circ} \pm S.$, 98° - $102^{\circ} W.$

The great river basin of southern Mexico. "The river itself is pretty dry. Collected up a side canyon to the south. Temp. 105-110, muggy. Thorn bush and rocks." *Potts*. The collection was made near Mexcala ($18^{\circ} 0' S.$, $99^{\circ} 30' W.$, 2400 ft.).

Tuxpango, Vera Cruz, ? 1500 ft.

"Top of a big wide barranca SE. of Orizaba. County similar to 'Orizaba.'" *Potts*.

Dismorphiinae

I am surprised that these two collectors, Hoogstraal and Potts, were so unsuccessful in finding members of this sub-family. At least nine species are known from the areas they visited. Only Hoogstraal collected any and his material represents one species.

61. *Enantia jethys* Boisduval.

G. & S. (1), 2: p. 182-183, 727, pl. 61, f. 56; pl. 74, f. 27, 28 (as *albania*).

R. (2), p. 100.

H. (3), p. 654-5.

Tancitaro, Michoacan, 6600 ft. 3 ♂♂ 2 ♀♀ vii.20-viii.14.40 (H.H.).

Hoffmann, p. 654-5, recognizes three species, *citronella* Felder (1861), *jethys* Bdv. (1836) and *mita* Reak (1866). I feel that these represent but one variable species. I have a long series of specimens from various tropical stations and among them are all intergrades from *jethys* to *citronella* to *mita*. Whether these are in turn only varieties of *melite* Linnæus or not I am not sure. The most heavily marked specimen should be referred to f. *jethys* Bdv., those without the dark bar along the inner margin of the forewing to f. *citronella* Felder, and those with further restriction of the dark apical markings to f. *mita*.

The specimens noted above are of f. *citronella*. I suspect that the degree to which the dark markings are developed is related to the season or moisture, the darkly marked individual being "wet season" the lightly marked, "dry season."

63. *Enantia marion*, Godman & Salvin.

G. & S., 2: 184.

R., p. 100.

H., p. 655.

El Sabino, Uruapan, Michoacan, 1 ♂ vii.15-30.36 (H.D.T.).

Pierinæ

(Euchloini)

72. *Hesperocharis costaricensis* Bates.

G. & S., 2: 126, pl. 60, f. 3, 4.

R., p. 79, pl. 23f.

H., p. 656.

Rio Blanco, Vera Cruz, 2200 ft., 1 ♂ v.10.41 (R.P.).

El Sabino, Uruapan, Michoacan, 1 ♀ vii.15-30.36 (H.D.T.).

Apparently this is the first record of the species from the east coast of Mexico. Hoffmann, p. 656, reports the species from the west coast of Guerrero, Michoacan, Jalisco and Colima.

(Rhodocerini)

74. *Colias eurytheme* Boisduval.

G. & S., 2: 151 (as *chrysotheme*).

R., p. 93, pl. 27f.

H., p. 656.

Hda. Vista Hermosa, Villa Santiago, Nuevo Leon, 1500 ft., 2 ♀♀ vi.17.40 (H.H.).

Galeana, Nuevo Leon, 6500 ft., 1 ♂ vii.30.39 (H.H.).

Tancitaro, Michoacan, 6600 ft., 1 ♂ viii.11.40 (H.H.).

These few specimens do not indicate the abundance of the species in Mexico. It is probable that the species was ignored in most localities. The Nuevo Leon material is f. *amphidusa* Bdv., the other is typical of f. *eurytheme*.

77. *Zerene cæsonia* Stoll.

G. & S., 2: 153, 727 (as *cesonia*).

R., p. 94, pl. 26f.

H., p. 656.

Hda. Vista Hermosa, Villa Santiago, Nuevo Leon, 1500 ft., 4 ♂♂ 1 ♀ vi.16-18.40 (H.H.).

Arroyo del Meco, Tamaulipas, 1320 ft., 1 ♂ iv.28.41 (R.P.).

Jacala, Hidalgo, 4500 ft., 7 ♂♂ 1 ♀ vi.25-vii.1.39 (H.H.).

El Bañito, Valles, San Luis Potosi, 200 ft., 1 ♂ vi. 28.40 (H.H.).

Tancitaro, Michoacan, 6600 ft., 1 ♀ vii.30.40 (H.H.).

Apatzingan, Michoacan, 1050 ft., 1 ♂ vii.5.40 (H.H.).

Rio Balsas, Guerrero, 2400 ft., 1 ♀ v.26.41 (R.P.).

Chilpancingo, Guerrero, 1 ♀ v.26.41 (R.P.).

The specimens are all in a condition indicating recent emergence.

78. *Anteos clorinde* Godart.

G. & S., 2: 148, 726.

R., p. 89, pl. 24g.

H., p. 656.

Victoria, Tamaulipas, 1 ♂ vi.25.35 (H. A. Freeman).

El Pujal, San Luis Potosi, 100 ft., 16 ♂♂ vii.17.39 (H.H.).

Arroyo del Calabozas, San Luis Potosi, 250 ft., 2 ♂♂ iv.30.41 (R.P.).

Hda. Potrero Viejo, nr. Parare Nuevo, Vera Cruz., 1500 ft., 1 ♂ v.5.41 (R.P.).

Rio Blanco, Vera Cruz, 2200 ft., 1 ♂ v.10.41 (R.P.).

Jacala, Hidalgo, 4500 ft., 3 ♂♂ vi.24-vii.7.39 (H.H.).

Apatzingan, Michoacan, 1 ♀ viii.2.40 (H.H.).

The Apatzingan ♀ is badly rubbed, but appears to lack the usual large yellow area on the forewing.

79. *Anteos mæricula* Fabricius.

G. & S., 2: 149, 726.

R., p. 89, pl. 24g.

H., p. 656.

Hda. Vista Hermosa, Villa Santiago, Nuevo Leon, 1500 ft., 2 ♂♂ vi.17-18.40 (H.H.).

Victoria, Tamaulipas, 1 ♂ vi.25.35 (H. A. Freeman).

60 mi. S. of Victoria, Tamaulipas, 1 ♂ vii.6.36 (H.D.T.).

El Bañito, Valles, San Luis Potosi, 200 ft., 4 ♂♂ 2 ♀♀ vi.26.40 (H.H.).

El Pujal, San Luis Potosi, 100 ft., 12 ♂♂ vii.17.39 (H.H.).

El Sol, Tamazunchale, San Luis Potosi, 150 ft., 1 ♂ 1 ♀ v.29.41 (R.P.).

Jacala, Hidalgo, 4500 ft., 3 ♂♂ vii.1-10.39 (H.H.).

Chichen Itza, Yucatan, 1 ♂ iv.7.36 (F.M.B.).

The females from El Bañito are f. *gueneeana* Bdv., the one from El Sol is the nymotypical form.

80. *Phoebis sennæ* Linnæus.

G. & S., 2: 141 (as *eubule*).

R., p. 85.

H., p. 657.

Hda. Vista Hermosa, Villa Santiago, Nuevo Leon, 1500 ft., 3 ♂♂ 1 ♀ vi.16-21.40 (H.H.).

- Hda. Santa Engracia, Tamaulipas, 2 ♂♂ vii.27.39 (H.H.).
 El Bañito, Valles, San Luis Potosi, 400 ft., 2 ♂♂ 1 ♀ vi.26-28.40 (H.H.).
 El Sol, Tamazunchale, San Luis Potosi, 400 ft., 1 ♂ 1 ♀ v.29.41 (R.P.).
 Jacala, Hidalgo, 4500 ft., 3 ♂♂ vi.29.39 (H.H.).
 Chichen Itza, Yucatan, 1 ♀ iv.8.36 (F.M.B.); 1 ♀ viii.30.36 (H.D.T.).
 Sta. Lucrecia, 1 ♂ ix.24.39 (H.D.T.).
 Apatzingan, Michoacan, 1200 ft., 2 ♂♂ 1 ♀ viii.3-5.40 (H.H.).
 El Sabino, Uruapan, Michoacan, 1 ♂ 1 ♀ vii.15-30.36 (H.D.T.).
 Tancitaro, Michoacan, 4500 ft. 1 ♂ viii.11.41 (H.H.).

The males from Nuevo Leon are fairly typical of race *eubule* L. the others tend toward *marcellina* Cr., but none of them is as strongly marked as the typical males from tropical South America. It is a pity that no one bothers to collect this common species in sufficient numbers to settle the question of what race the Mexican material represents. I would designate all of the above males *eubule* f. *drya* Fabricius. I fully realize that elsewhere (*Amer. Mus. Nov.* 368, p. 7, 1929) I stated that Mexican material was referable to *marcellina* Cr. I also noted (p. 8) that the tropical race might well represent two races. The more material that I see from Mexico the more I feel that these statements need revising, but I have not the material to do so. It is quite probable that in Mexico the two races so intergrade that we have a continuous cline from *eubule* to *marcellina*.

The El Banito female is f. *pallida* Cockerell, the El Sol, *yamana* Reakirt. The Hda. Vista Hermosa female is a good *marcellina* Cr. The Apatzingan female is badly rubbed but is probably f. *yamana*. F.M.B.'s from Chichen Itza is *pallida* while H.D.T.'s is *marcellina*.

81. *Phoebis philea* Linnæus.

G. & S., 2: 140, 726.

R., p. 86, pl. 25c.

H., p. 657.

El Pujal, San Luis Potosi, 100 ft., 2 ♂♂ vii.17.39 (H.H.).
(H.H.).

Apatzingan, Michoacan, 1200 ft., 1 ♂ viii.5.40 (H.H.).

83. *Phoebis agarithe maxima* Neumoegen.

G. & S., 2: 145, 726 (as *agarithe*).

R., p. 86 (as *argante agaritha*).

H., p. 657.

Hda. Vista Hermosa, Nuevo Leon, 1500 ft., 6 ♂♂ 3 ♀♀
vi.16-21.40 (H.H.).

Sabinas Hidalgo, Nuevo Leon, 960 ft., 2 ♂♂ 2 ♀♀
vi.15-18.39 (H.H.).

Arroyo del Meco, Tamaulipas, 1320 ft., 2 ♂♂ iv.28.41
(R.P.).

Hda. Santa Engracia, Tamaulipas, 2 ♂♂ vii.25.39
(H.H.).

Victoria, Tamaulipas, 1 ♀ vi.28.35 (H. A. Freeman).

60 mi. S. Victoria, Tamaulipas, 1 ♀ vii.6.36 (H.D.T.).

El Pujal, San Luis Potosi, 100 ft., 3 ♂♂ vii.20-21.39
(H.H.).

El Sol, Tamazunchale, San Luis Potosi, 400 ft., 1 ♂
v.29.41 (R.P.).

Tamazunchale, San Luis Potosi, 500 ft., 1 ♂ vi.30.40
(H.H.).

Arroyo del Calabezas, San Luis Potosi, 250 ft., 1 ♂
iv.30.41 (R.P.).

El Bañito, San Luis Potosi, 200 ft., 3 ♂♂ 1 ♀ $\left\{ \begin{array}{l} \text{vii.22.39} \\ \text{(H.H.).} \\ \text{vi.26.40} \\ \text{(H.H.).} \end{array} \right.$

El Mante, San Luis Potosi, 1 ♂ iv.29.41 (R.P.).

Orizaba, Vera Cruz, 2000 ft., 1 ♂ v.6.41 (R.P.).

These are all good *maxima* except the El Sol male which approaches *agarithe*. The northern specimens are absolutely typical, those from the south show some of the brownish markings on the underside. All the females are f. *albarithe* Brown.

83c. *Phoebis agarithe agarithe* Boisduval.

Progreso, Yucatan, 1 ♀ viii.27.36 (H.D.T.).

Chichen Itza, Yucatan, 1 ♀ viii.30.36 (H.D.T.).

These two females are much more like typical South American *agarithe* than *maxima* and I have so designated them. They are not *antillia* Brown, which might be expected on the peninsula. The Progresso specimen is the yellow form, the Chichen Itza one the white form. Hoffmann has not included this race in his check-list.

84. *Phoebis intermedia* Butler.

G. & S., 2: 143, 726 (as *rudina*).

R., p. 86.

H., p. 657.

Tancitaro, Michoacan, 4500 ft., 1 ♂ vii.25.40 (H.H.).

86. *Aphrissa statira jada* Butler.

G. & S., 2: 147 (as *statira*).

R., p. 87 (as *statira*).

H., p. 657.

El Bañito, Valles, San Luis Potosi, 200 ft., 1 ♀ vi.26.40 (H.H.).

This is a pale lemon yellow female like those of true *statira*.

87. *Kricogonia lyside* Godart.

G. & S., 2: 150, 151, 726 (as *unicolor*).

R., p. 89.

H., p. 658.

Sabinas Hidalgo, Nuevo Leon, 900 ft., 9 ♂♂ 10 ♀♀ vi.15-18.39 (H.H.).

Ojo de Agua, Sabinas Hidalgo, N. L., 1000 ft., 2 ♂♂ vi.14.40 (H.H.).

Villa Santiago, Nuevo Leon, 1500 ft., 2 ♂♂ viii.8.39 (H.H.).

35 km. W. of Linares, Nuevo Leon, 1 ♀ viii.7.39. (H.H.).

Galeana, Nuevo Leon, 2 ♂♂ 2 ♀♀ vii.28-viii.4.39. (H.H.).

Hda. Sta. Engracia, Tamaulipas, 1 ♂ 1 ♀ vii.25-27.39 (H.H.).

El Bañito, Valles, San Luis Potosi, 1 ♀ vii.22.39 (H.H.).

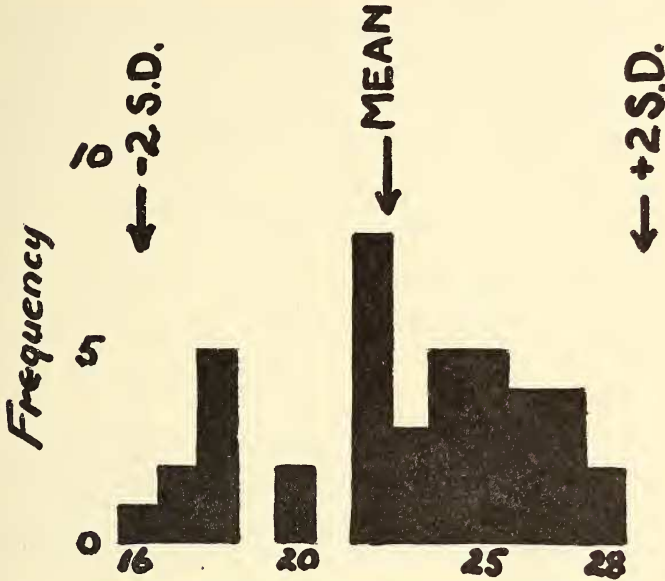
nr. Apatzingan, Michoacan, 500 ft., 3 ♂♂ 3 ♀♀ viii.3.40 (H.H.).

Apatzingan, Michoacan, 1050 ft., 1 ♂ 2 ♀♀ viii.2-5.40 (H.H.).

El Sabino, Uruapan, Michoacan, 2 ♂♂ 1 ♀ vii.15-30.36 (H.D.T.).

Acahuato, Michoacan, 3000 ft., 1 ♀ viii.2.40 (H.H.).

Tancitaro, Michoacan, 6600 ft., 1 ♂ vii.20.40 (H.H.).



It is rather strange that Potts took no specimens of this common species. The above series contains examples of all of the named forms that occur in Mexico.

	typical	♂ <i>terrissa</i>	♀ <i>unicolor</i>	♀ <i>fantasia</i>
Nuevo Leon	21	5	4	1?
Tamaulipas		1	1	...
San Luis Potosi	1	...	...	...
Michoacan	7	3	1	4

The specimens noted as *fantasia* are not typical; they all lack the costal yellow streak and the ground color of the wings tends to be greenish rather than yellow. The size of the specimens varies greatly. This is best shown in the text figure, based upon the baso-apical radius of the forewings, and the following table of data.

	N.	Mean	S.D.	Critical limits	Range
Total					
series ...	45	21.37 ± 0.57 mm.	3.66 mm.	14.1 mm., 28.7 mm.	16-28 mm.
Sabinas					
Hidalgo	19	22.90 ± 0.34 mm.	3.27 mm.	16.5 mm., 29.4 mm.	16-28 mm.

88. **Eurema albula** Cramer.

G. & S., 2: 166.

R., p. 84.

H. p. 658.

K. (4), p. 121.

El Sol, Tamazunchale, San Luis Potosi, 400 ft., 11 ♂♂
iv.30, v.29.41 (R.P.).

Ojo de Agua, Vera Cruz, 1600 ft., 4 ♂♂ v.12.41 (R.P.).

El Sabino, Uruapan, Michoacan, 1 ♂ vii.15-30.36
(H.D.T.).

Two of the Ojo de Agua specimens are intermediate to *albula*
and f. *tapeina* Bates.

89. **Eurema jucunda** Boisduval.

G. & S., 2: 168, pl. 64, f. 9-12.

R., p. 83, pl. 24e.

H., p. 658.

K., p. 124.

nr. Acapulco, Guerrero, 100 ft., 1 ♀ v.26.41 (R.P.).

nr. Chilpancingo, Guerrero, 4 ♂♂ 3 ♀♀ v.26.41 (R.P.).

Rio Balsas, Guerrero, 2400 ft., 1 ♀ v.26.41 (R.P.).

El Sabino, Uruapan, Michoacan, 10 ♂♂ 9 ♀♀ vii.15-30.36
(H.D.T.).

Apatzingan, Michoacan, 3000 ft., 1 ♂ viii.2.40 (H.H.).

Tancitaro, Michoacan, 6600 ft., 1 ♂ 1 ♀ vii.25, viii.11.40
(H.H.).

All the males are of f. *sidonia* Felder. This is also true of the females except for two from Chilpancingo which tend toward the typical in respect to the margin of the hindwings. The general color of the females varies from white to pale yellow. One of the Chilpancingo specimens and the one from Rio Balsas have white forewings and yellow hindwings.

89a. **Eurema jucunda lydia** Felder.

G. & S., 2: 170, pl. 63, f. 20-23.

R., p. 83 (as *delia lydia*).

H., p. 658.

K., p. 126 (as *palmyra lydia*).Jacala, Hidalgo, 4500 ft., 3 ♂♂ 2 ♀♀ vi.25-vii.2.39
(H.H.).

El Pujal, San Luis Potosi, 100 ft., 5 ♂♂ 2 ♀♀ vii.17–21.39 (H.H.).

Tuxpango, Vera Cruz, 1500 ft., 1 ♂ 2 ♀♀ v.9.41 (R.P.).

Hda. Potrero Viejo, Vera Cruz, 1500 ft., 1 ♂ 1 ♀ v.5.41 (R.P.).

Orizaba, Vera Cruz, 2000 ft., 4 ♂♂ 1 ♀ v.6.41 (R.P.).

Rio Blanco, Vera Cruz, 2200 ft., 2 ♂♂ 1 ♀ v.10.41 (R.P.).

This series of "barred" *Euremas* from the east coast is quite variable. All have the pearly white under surfaces characteristic of *jucunda*. The females are fairly constant, having a reduced grey bar on the inner margin of the forewing and an incomplete black margin on the hindwing. One Jacala specimen is faintly flushed with yellow on the forewing and the Rio Blanco female bears this flush on the hindwing. The males are extremely varied but I hesitate to refer the specimen to anything other than *lydia*. The marginal band of black on the hindwings is broad and complete on two (Rio Blanco and Orizaba), narrower but complete on two (El Pujal) and interrupted on the rest. In no case is the margin reduced to an apical spot. The hindwings range from yellow (♂ Jacala) to white with many specimens just faintly tinged with yellow. Until a lot of life history work is done and enormous series taken over long periods of time for many localities we will not be able to unravel the puzzle of the "barred" *Euremas*.

91. *Eurema boisduvaliana* Felder.

G. & S., 2: 159, pl. 63, f. 1–4.

R., p. 81 (as *mexicana*, in part).

H., p. 658.

K., p. 133.

Galeana, Nuevo Leon, 6500 ft., 1 ♂ 10.29.41 (R.P.).

Jacala, Hidalgo, 4500 ft., 4 ♂♂ 1 ♀?, vi.29–vii.5.39 (H.H.).

El Pujal, San Luis Potosi, 100 ft., 11 ♂♂ vii.12–21.39 (H.H.).

Arroyo del Calabazas, San Luis Potosi, 1 ♂ iv.30.41 (R.P.).

El Bañito, Valles, San Luis Potosi, 1 ♂ 1 ♀ vi.26–27.40 (H.H.).

El Sol, Tamazunchale, San Luis Potosi, 2 ♂♂ v.29.41 (R.P.).

Fortin, Vera Cruz, 1600 ft., 2 ♂♂ v.4.41 (R.P.).

Orizaba, Vera Cruz, 2000 ft., 1 ♂ v.4.41 (R.P.).

Rio Blanco, Vera Cruz, 2200 ft., 8 ♂♂ v.10.41 (R.P.).

Chichen Itza, Yucatan, 1 ♂ viii.30.36 (H.D.T.).

El Sabino, Uruapan, Michoacan, 1 ♀?, vii.15-30.36 (H.D.T.).

Apatzingan, Michoacan, 3200 ft., 1 ♀ viii.2.40 (H.H.).

The questioned female from Jacala is aberrant. The apical patch on the hindwings is reduced to a few scales along the nervule. The same is true of the El Sabino female.

92. *Eurema xanthochlora* Kollar.

G. & S., 2: 161, 727, pl. 63, f. 5-8.

R., p. 81, pl. 24b.

H., p. 658.

K., p. 134.

El Bañito, Valles, San Luis Potosi, 200 ft., 1 ♀ vi.28.40 (H.H.).

Tuxpango, Vera Cruz, 1500 ft., 1 ♂ v.9.41 (R.P.).

93. *Eurema mexicana mexicana* Boisduval.

G. & S., 2: 157.

R., p. 81, pl. 24a.

H., p. 659.

K., p. 134.

Hda. Vista Hermosa, Villa Santiago, Nuevo Leon, 1500-3000 ft., 6 ♂♂ 1 ♀ vi.17-21.40 (H.H.).

Villa Santiago, Nuevo Leon, 1500 ft., 1 ♂ viii.8.39 (H.H.).

Jacala, Hidalgo, 4500 ft., 37 ♂♂ 1 ♀ vi.23-vii.2.39 (H.H.).

El Pujal, San Luis Potosi, 100 ft., 1 ♂ vii.17.39 (H.H.).

El Sol, Tamazunchale, 400 ft., 8 ♂♂ v.28-29.41 (R.P.); 1 ♀ iv.31.41 (R.P.).

Tuxpango, Vera Cruz, 1500 ft., 1 ♀ v.8.41 (R.P.).

Rio Blanco, Vera Cruz, 2200 ft., 5 ♂♂ v.10.41 (R.P.).

Cumbres (km. 295), Vera Cruz, 6000 ft., 1 ♂ v.7.41 (R.P.).

El Sabino, Uruapan, Michoacan, 3 ♂♂ vii.15-30.36 (H.D.T.).

Tancitaro, Michoacan, 6600 ft., 1 ♂ viii.14.40 (H.H.).

Cerro Tancitaro, Michoacan, 7000 ft., 2 ♂♂ vii.20.40 (H.H.).

All these specimens are typical *mexicana*. Hoffmann includes in his listing of the species both ab. *recta* Klots and ab. *biedermanni* Ehrmann with question marks. I have a distinct feeling that these two "aberrations" describe the material from the northern reaches of the race such as the mountains of Colorado and should be raised to racial status. Ehrmann's name is available for this. There is some variation in size among the specimens before me. A male from Villa Santiago measures only 15 mm. along the baso-apical radius of the forewing while the largest specimen from El Sol measures 27 mm. The black margin of the hindwing is variable; on some specimens it is a small patch anterior to M_2 while in others it extends to Cu_2 . On these latter it is broadest at the M_2 - M_3 interspaces and has a basad spur in M_3 - Cu_1 .

94. *Eurema salome* Felder.

G. & S., 2: 160 (as *fabiola*).

R., p. 81.

H., p. 659.

K., p. 136.

Jacala, Hidalgo, 4500 ft., 16 ♂♂ vi.23-vii.2.39 (H.H.).

Fortin, Vera Cruz, 1600 ft., 1 ♂ v.3.41 (R.P.).

These are all f. *limoneus* Felder. I disagree with Hoffmann and agree with Klots on the status of this name. I feel that the species is splitting into two races and that the northern material from Mexico is sufficiently different from Ecuadorian *salome* to require a name in this genus.

95. *Pyristia gundlachia* Poey.

G. & S., 2: 156.

R., p. 81, pl. 21a.

H., p. 659.

K., p. 137.

Hda. Vista Hermosa, Villa Santiago, Nuevo Leon, 1500 ft., 2 ♀♀ vi.17-22.40 (H.H.).

96. *Pyristia proterpia* Fabricius.

G. & S., 2: 155.

R., p. 81, pl. 24a.

H., p. 659.

K., p. 137.

nr. Villagran, Tamaulipas, 1160 ft., 1 ♂ iv.28.41 (R.P.).

C. Victoria, Tamaulipas, 1 ♂ vi.19.39 (H.H.).

Hda. Sta. Engracia, Tamaulipas, 1 ♂ vii.27.39 (H.H.).

El Pujal, San Luis Potosi, 100 ft., 3 ♂♂ 1 ♀ vii.17-20.39 (H.H.).

Rio Blanco, Vera Cruz, 2200 ft., 2 ♂♂ v.10.41 (R.P.).

Chichen Itza, Yucatan, 1 ♂ viii.30.36 (H.D.T.).

Acapulco, Guerrero, 100 ft., 1 ♂ v.26.41 (R.P.).

Apatzingan, Michoacan, 1050 ft., 5 ♂♂ viii.2-5.40 (H.H.).

El Sabino, Uruapan, Michoacan, 10 ♂♂ 4 ♀♀ vii.15-30.36 (H.D.T.).

Tancitaro, Michoacan, 7000 ft., 1 ♂ 1 ♀ vi.25-30.40 (H.H.).

On the northernmost specimen (Villagran) the black markings are greatly reduced. The Chichen Itza specimen approaches *watsoni* from the similar arid area in Ecuador!

97. *Pyristia dina westwoodi* Boisduval.G. & S., 2: 163 (as *dina*).

R., p. 82, pl. 24b.

H., p. 659.

K., p. 139.

El Sol, Tamazunchale, San Luis Potosi, 400 ft., 7 ♂♂ 4 ♀♀ iv.30-31, v.28-29.41 (R.P.).

Arroyo del Calabazas, San Luis Potosi, 250 ft., 1 ♂ iv.30.41 (R.P.).

Chichen Itza, Yucatan, 1 ♂ viii.30.36 (H.D.T.); 1 ♀ iv.7.36 (F.M.B.).

N. of Iguala, Guerrero, 1 ♂ v.22.41 (R.P.).

All the females are much lighter than the males and in many respects, other than size, compare favorably with f. ♀ *citrina* Poey from the West Indies. The West Coast male is the exact counterpart of race *parvumbra* Kaye from Jamaica!

98. *Pyristia lisa euterpe* Ménètries.

G. & S., 2: 162.

R., p. 83.

H., p. 659.

K., p. 138.

Sabinas Hidalgo, Nuevo Leon, 960 ft., 1 ♂ vi.15.39 (H.H.).

nr. Villagran, Tamaulipas, 1150 ft., 3 ♂♂ iv.28.41 (R.P.).

60 mi. So. of Victoria, Tamaulipas, 2 ♂♂ vii.6.36 (H.D.T.).

Jacala, Hidalgo, 4500 ft., 1 ♂ vii.6.39 (H.H.).

El Pujal, San Luis Potosi, 100 ft., 1 ♀ vi.20.39 (H.H.).

Rio Blanco, Vera Cruz, 2200 ft., 1 ♂ v.10.41 (R.P.).

The female is f. *centralia* Herrick-Schaffer (*alba* Strecker).99. *Pyristia nise perimede* Prittwitz.G. & S., 2: 165, 727 (as *tenella*).R., p. 83, pl. 24d (as *nise*).

H., p. 659.

K., p. 140.

Sabinas Hidalgo, Nuevo Leon, 960 ft., 1 ♂ vi.31.39 (H.H.).

nr. Villagran, Tamaulipas, 1160 ft., 2 ♂♂ iv.28.41 (R.P.).

C. Victoria, Tamaulipas, 1 ♀ vi.19.39 (H.H.).

60 mi. So. of Victoria, Tamaulipas, 1 ♂ vii.6.36 (H.D.T.).

Hda. Sta. Engracia, Tamaulipas, 1 ♂ vii.25.39 (H.H.).

Jacala, Hidalgo, 4500 ft., 5 ♂♂ 2 ♀♀ vi.23-vii.2.39 (H.H.).

El Pujal, San Luis Potosi, 100 ft., 3 ♀♀ vii.18-21.39 (H.H.).

Arroyo del Calabezas, San Luis Potosi, 250 ft., 1 ♂
iv.30.41 (R.P.). zEl Sol, Tamazunchale, San Luis Potosi, 400 ft., 1 ♂ 1 ♀
v.28-29.41 (R.P.).El Bañito, Valles, San Luis Potosi, 150 ft., 5 ♂♂ 2 ♀♀
vi.26.40, vii.22.39 (H.H.); iv.30.41 (R.P.).Hda. Potrero Viejo, Paraje Nuevo, Vera Cruz, 1500 ft.,
3 ♂♂ v.5.41 (R.P.).

Orizaba, Vera Cruz, 2000 ft., 2 ♂♂ v.6.41 (R.P.).
 Rio Blanco, Vera Cruz, 2200 ft., 8 ♂♂ v.10.41 (R.P.).
 Ojo de Agua, Vera Cruz, 1600 ft., 1 ♀ v.12.41 (R.P.).
 Acapulco, Guerrero, 100 ft., 1 ♂ v.23-25.41 (R.P.).
 Sta. Lucrecia, 1 ♂ ix.24.39 (H.D.T.).
 Apatzingan, Michoacan, 500 ft., 1 ♂ viii.3.40 (H.H.).
 El Sabino, Uruapan, Michoacan, 5 ♂♂ 2 ♀♀ vii.15-30.36
 (H.D.T.).

There is a great deal of variation in this series, none of it related to geographic distribution. The ground color varies from pale to deep lemon. The dark margin on the hindwings varies from complete to absent; on over half of the specimens it is represented by only a row of black dots on the nervules. There is some variation in the extent of the black marking on the forewing. On some the underside is boldly marked; on others it is almost immaculate.

100. *Abæis nicippe* Cramer.

G. & S., 2: 155, 727.

R., p. 81, pl. 24a.

K., p. 132.

H., p. 659.

Sabinas Hidalgo, Nuevo Leon, 960 ft., 5 ♂♂ vi.15-16.39
 (H.H.).

Ojo de Agua, Sabinas Hidalgo, Nuevo Leon, 1300 ft.,
 1 ♂ vi.14.40 (H.H.).

Hda. Vista Hermosa, Villa Santiago, Nuevo Leon, 1500
 ft., 1 ♂ 2 ♀♀ vi.16-21.40 (H.H.).

Galeana, Nuevo Leon, 6500 ft., 2 ♂♂ vii.30-viii.3.39
 (H.H.).

Jacala, Hidalgo, 4500 ft., 11 ♂♂ vi.23-vii.2.39 (H.H.).

El Pujal, San Luis Potosi, 100 ft., 1 ♂ n.d. (H.H.).

Hda. Potrero Viejo, nr. Paraje Nuevo, Vera Cruz, 1500
 ft., 1 ♂ vi.5.41 (R.P.).

Monte Alban, Oaxaca, 6000 ft., 1 ♂ v.18.41 (R.P.).

The Monte Alban specimen is notable for the reduction of the dark apical markings on it.

101. *Nathalis iole* Boisduval.

G. & S., 2: 172, pl. 64, ff. 15-18.

R., p. 95, pl. 27h (as *jole*).

H., p. 659.

bet. Adjuntas & Sabinas Hidalgo, Nuevo Leon, 3000 ft., 1 ♂ vi.21.40 (H.H.).

Sabinas Hidalgo, Nuevo Leon, 1500 ft., 1 ♂ 1 ♀ vi.17.40 (H.H.).

Ojo de Agua, Sabinas Hidalgo, Nuevo Leon, 1000 ft., 1 ♂ vi.15.40 (H.H.).

Galeana, Nuevo Leon, 6500 ft., 1 ♂ vii.30.39 (H.H.).

nr. Villagran, Tamaulipas, 1160 ft., 1 ♂ iv.28.41 (R.P.).

C. Victoria, Tamaulipas, 1 ♀ vi.19.39 (H.H.).

60 mi. So. of Victoria, Tamaulipas, 1 ♀ vii.6.36 (H.D.T.).

Jacala, Hidalgo, 4500 ft., 10 ♂♂ 1 ♀ vi.23-vii.1.39. (H.H.).

El Sol, Tamazunchale, San Luis Potosi, 400 ft., 1 ♂ v.29.41 (R.P.).

El Bañito, Valles, San Luis Potosi, 150 ft., 2 ♂♂ iv.30.41 (R.P.).

El Pujal, San Luis Potosi, 100 ft., 1 ♂ 1 ♀ vii.17.39 (H.H.).

Tuxpango, Vera Cruz, 1500 ft., 2 ♂♂ v.9.41 (R.P.).

Orizaba, Vera Cruz, 2000 ft., 1 ♂ 1 ♀ v.6.41 (R.P.).

Cumbres (km. 295), Vera Cruz, 8000 ft., 3 ♂♂ v.7.41 (R.P.).

Monte Alban, Oaxaca, 6000 ft., 1 ♀ v.18.41 (R.P.).

The females from all localities other than Jacala and Monte Alban are f. *irene* Fitch. One of the Jalaca males has the fore-wing bar reduced to a submarginal spot.

(Pierini)

103. *Neophasia terlootii* Behr.

R., p. 55, pl. 18a.

H., p. 660.

Cerro Tancitaro, Michoacan, 5500 ft., 1 ♂ viii.17.40 (H.H.).

This capture of Hoogstraal's extends the range of this species over 300 miles southward. I suspect that it will be recovered still

further south, possibly in Central America in the pine-oak forests of Guatemala and Honduras.

104. *Catasticta flisa* Herriek-Schaffer.

G. & S., 2: 117.

R., p. 73, pl. 22e.

H., p. 660.

Jacala, Hidalgo, 4500 ft., 1 ♂ vi.29.39 (H.H.).

This extends the range of the species northward from Vera Cruz (see H., p. 660).

105. *Catasticta nimbice nimbice* Boisduval.

G. & S., 2: 118.

R., p. 70, pl. 22b.

H., p. 660.

Jacala, Hidalgo, 4500 ft., 2 ♂♂ vi.24-28.39 (H.H.).

Tancitaro, Michoacan, 6600 ft., 1 ♀ vii.30.40 (H.H.).

The female is freshly emerged, the males are worn.

110. *Appius ilaire* Godart.

G. & S., 2: 135 (as *margarita*).

R., p. 59, pl. 19c.

H., p. 661.

El Bañito, Valles, San Luis Potosi, 200 ft., 1 ♂ vi.28.40 (H.H.).

113. *Pieris protodice* Boisduval & Le Conte.

G. & S., 2: 130, 724.

R., p. 59.

H., p. 661.

Sabinas Hidalgo, Nuevo Leon, 960 ft., 1 ♀ vi.15.39 (H.H.).

Hda. Vista Hermosa, nr. Villa Santiago, Nuevo Leon, 1600 ft., 1 ♂ 3 ♀♀ vi.16.40 (H.H.).

Galeana, Nuevo Leon, 6500 ft., 1 ♀ viii.1.39 (H.H.).

Monterrey, Nuevo Leon, 1600 ft., 1 ♀ iv.27.41 (R.P.).

nr. Villagran, Tamaulipas, 1160 ft., 1 ♂ 1 ♀ iv.28.41 (R.P.).

El Bañito, Valles, San Luis Potosi, 200 ft., 2 ♂♂ vi.28.40 (H.H.).

114. *Pieris rapæ* Linnæus.

R., p. 58, pl. 19b.

H., p. 661.

Galeana, Nuevo Leon, 6500 ft., 2 ♂♂ viii.4.39 (H.H.).

This species seems to have reached Mexico since the publication of the *Biologia* (since 1900?).

116. *Leptophobia aripa* Boisduval.G. & S., 2: 136, 726 (as *elodia*).

R., p. 60, pl. 19d.

H., p. 661.

nr. Villagran, Tamaulipas, 1160 ft., 1 ♀ iv.28.41 (R.P.).

Jacala, Hidalgo, 4500 ft., 2 ♂♂ vi.28.39 (H.H.).

Fortin, Vera Cruz, 1600 ft., 1 ♂ v.3.41 (R.P.).

Ojo de Agua, Vera Cruz, 1600 ft., 1 ♂ v.12.41 (R.P.).

Orizaba, Vera Cruz, 200 ft., 1 ♂ v.6.41 (R.P.).

117. *Itaballia demophile calydonia* Boisduval.

G. & S., 2: 131.

R., p. 63.

H., p. 661.

El Sol, Tamazunchale, San Luis Potosi, 400 ft., 1 ♂
v.29.41 (R.P.).

The subapical cross bar on the upper sides of the forewings is totally lacking, on the underside it is reduced to little more than a broad line. This specimen extends the range northward from southern Vera Cruz (see H., p. 661).

119. *Pieriballia viardi viardi* Boisduval.

G. & S., 2: 133, 725, pl. 62, f. 1-4.

R., p. 62.

H., p. 661.

El Sol, Tamazunchale, San Luis Potosi, 400 ft., 1 ♂
iv.31.41 (R.P.).

El Pujal, San Luis Potosi, 100 ft., 1 ♂ 1 ♀ vii.20-21.39
(H.H.).

121. *Ascia monuste cleomes* Boisduval.G. & S., 2: 132, 725 (as *monuste*).

R., p. 57.

H., p. 662.

- Hda. Vista Hermosa, Villa Santiago, Nuevo Leon, 1600 ft., 1 ♀ vi.17.40 (H.H.).
- Galeana, Nuevo Leon, 6500 ft., 1 ♀ iv.29.41 (R.P.).
- nr. Villagran, Tamaulipas, 1160 ft., 1 ♀ iv.28.41 (R.P.).
- Arroyo del Meco, Tamaulipas, 1 ♂ iv.28.41 (R.P.).
- C. Victoria, Tamaulipas, 2 ♀♀ vi.27.35 (H. A. Freeman); 2 ♂♂ vi.19.39 (H.H.).
- 60 mi. So. of Victoria, Tamaulipas, 3 ♂♂ vii.6.36 (H.D.T.).
- Jacala, Hidalgo, 5400 ft., 1 ♂ 1 ♀ vii.1.39 (H.H.).
- El Sol, Tamazunchale, San Luis Potosi, 400 ft., 2 ♂♂ v.29.41 (R.P.).
- Arroyo del Calabozas, San Luis Potosi, 250 ft., 1 ♂ 10.30.41 (R.P.).
- El Bañito, Valles, San Luis Potosi, 200 ft., 2 ♂♂ 2 ♀♀ vi.26.40, vii.19.39 (H.H.).
- El Pujal, San Luis Potosi, 100 ft., 3 ♂♂ vii.17-19.39 (H.H.).
- Tuxpango, Vera Cruz, 1500 ft., 1 ♂ v.9.41 (R.P.).
- Hda. Potrero Viejo, Paraje Nuevo, Vera Cruz, 1500 ft., 1 ♀ v.5.41 (R.P.).
- Rio Blanco, Vera Cruz, 2200 ft., 1 ♂ v.10.41 (R.P.).
- Apatzingan, Michoacan, 1200 ft., 2 ♂♂ 1 ♀ viii.5.40 (H.H.).

The males are rather uniform throughout. The marginal dark spots on the hindwing are variable, being represented by either a few scales or a small triangular patch. This does not seem to be related to the origin of the specimens. One male from 60 miles South of Victoria is almost immaculate on both upper and lower surfaces. The females fall into two clearly defined groups. Those from Nuevo Leon, Tamaulipas and Michoacan have a pinkish iridescence on the upper surface and one (from Victoria) approaches *phileta* Fabricius. Those from San Luis Potosi, Hidalgo and Vera Cruz are a dull buff-yellow on the hindwings and the same with a slightly pinkish tone on the forewings.

123. **Melete isandra** Boisduval.

G. & S., 2: 139, 726, pl. 61, ff. 13, 14.

R., p. 77, pl. 23b.

H., p. 662.

El Bañito, Valles, San Luis Potosi, 200 ft., 1 ♂ 1 ♀
vii.19.39 (H.H.).

El Pujal, San Luis Potosi, 100 ft., 3 ♂♂ vii.17-20.39
(H.H.).

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